

SURAT TUGAS

Nomor : 0233A-d/D.5/FP/IX/2023

Dekan Fakultas Psikologi Universitas Katolik Soegijapranata Semarang memberikan tugas kepada yang tersebut dibawah ini :

- Nama : **Dr. Margaretha Sih Setija Utami, M.Kes.**
Dr. Augustina Sulastri, Psikolog
Drs. Haryo Goeritno, M.Si.
Lucia Trisni Widhianingtanti, S.Psi., M.Si.
- Status : Dosen Fakultas Psikologi UNIKA Soegijapranata
- Tugas : Menulis Artikel "Adaptation of Rey Auditory Verbal Learning Test for Indonesia: Its Validity and Reliability"
- Waktu : September 2023 s.d Februari 2024
- Tempat : Jurnal Neuro Psychologica tahun 2024 Volume 22, nomor 1 halaman 15-34
- Lain – lain : Harap melaksanakan tugas dengan sebaik – baiknya dan penuh rasa tanggung jawab

Demikian surat tugas ini dibuat untuk diketahui dan dipergunakan sebagaimana mestinya.



Semarang, 29 September 2023

Dekan,

Dr. Dra. Kristiana Haryanti, M.Si.
NPP. 5811993137

Submission confirmation/Potwierdzenie przyjęcia manuskryptu ID: 40464

noreply@indexcopernicus.com <noreply@indexcopernicus.com>

Thu, Apr 13, 2023 at 9:19 AM

Reply-To: noreply@indexcopernicus.com

To: Utami Margaretha Sih Setija <cicih@unika.ac.id>

Powiadomienie z systemu ICI Publisher Panel

Submission confirmation/Potwierdzenie przyjęcia manuskryptu ID: 40464

Submission confirmation - Notification from the ICI Publishers Panel system**Submission confirmation**

Manuscript: #40464

Title: Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability

Authors: Utami Margaretha Sih Setija, Sulastris Augustina, Santoso Justinus Budi, Suryani Angela Oktavia,

Goeritno Haryo, Widhianingtanti Lucia Trisni, van Lujtelaar Gilles

Date: 10/04/2023

Dear Author,

Thank you for submitting Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability. We will now verify whether it fits our Journal's scope and check the completeness of the information we need in order to evaluate and publish your manuscript. Whenever you wish to check its status, sign in to your account at [ICI Publishers Panel](#).

Yours faithfully,
Acta Neuropsychologica

Potwierdzenie przyjęcia manuskryptu - Powiadomienie z systemu ICI Publishers Panel**Potwierdzenie przyjęcia manuskryptu**

Manuskrypt: #40464

Tytuł: Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability

Autorzy: Utami Margaretha Sih Setija, Sulastris Augustina, Santoso Justinus Budi, Suryani Angela Oktavia,

Goeritno Haryo, Widhianingtanti Lucia Trisni, van Lujtelaar Gilles

Data: 10/04/2023

Szanowny Autorze,

Dziękujemy za złożenie manuskryptu Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability. Zweryfikujemy czy odpowiada tematyce naszego czasopisma i czy wprowadzone zostały wszystkie dane, których potrzebujemy w celu przeprowadzenia procesu recenzji oraz publikacji manuskryptu na łamach naszego czasopisma. Aby sprawdzić postępy redakcji w pracach nad manuskryptem, należy zalogować się na swoje konto w [ICI Publishers Panel](#).

Z wyrazami szacunku,
Acta Neuropsychologica



Margaretha Sih Setija Utami <cicih@unika.ac.id>

Confirming my article

Margaretha Sih Setija Utami <cicih@unika.ac.id>
To: neuropsychologia23@o2.pl

Sat, Nov 4, 2023 at 8:50 AM

Dear Maria Pachalska
President, Polish Neuropsychological Society, Cracow, Poland

I am Margaretha Sih Setija Utami, the first author of an article titled Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability. I have sent the article to Acta Neuropsychologica Journal and I got notification that my article was submitted on 13th April 2023. We are waiting for the progress of my article.

Would you like to inform me what I should do to get my article published?
I am waiting for your reply.

List of notifications Creation dates in descending order

Reference number	Created on	Receiver	Title	
#ICIP40464	05:19 13.04.2023	Utami Margaretha cicih@unika.ac.id	Submission confirmation/Potwierdzenie przyjęcia manuskryptu ID: 40464	Details

(RECORDS: 1 - 1 FROM 1, PAGE: 1/1) < > 50

List of notifications Creation dates in descending order

Reference number	Created on	Receiver	Title	
#ICIP40464	05:19 13.04.2023	Utami Margaretha cicih@unika.ac.id	Submission confirmation/Potwierdzenie przyjęcia manuskryptu ID: 40464	Details

(RECORDS: 1 - 1 FROM 1, PAGE: 1/1) < > 50

Subject: Submission confirmation/Potwierdzenie przyjęcia manuskryptu ID: 40464
Receiver: Utami Margaretha [cicih@unika.ac.id]

Submission confirmation - Notification from the ICI Publishers Panel system

Submission confirmation

Manuscript: #40464
Title: Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability
Authors: Utami Margaretha Sih Setija, Sulastris Augustina, Santoso Justinus Budi, Suryani Angela Oktavia, Goeritno Haryo, Widhianingtanti Lucia Trisni, van Luijtelaar Gilles
Date: 10/04/2023

Dear Author,

Thank you for submitting Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability. We will now verify whether it fits our Journal's scope and check the completeness of the information we need in order to evaluate and publish your manuscript. Whenever you wish to check its status, sign in to your account at [ICI Publishers Panel](#).

Yours faithfully,
Acta Neuropsychologica

Best regards,
Margaretha Sih Setija Utami
- Powered by [unika.ac.id](mailto:cicih@unika.ac.id) mail service

Acta Neuropsychologica 22(1) 2024 Margaretha Sih Setija Utami

neuropsychologia23 <neuropsychologia23@o2.pl>
To: cicih <cicih@unika.ac.id>

Sun, Nov 5, 2023 at 12:59 PM

Dear Author,

Your article is after two positive review, and it is approved for publication. We only need to correct some technical remarks suggested by the reviewers.

If you want me to speed up the article send me the text, figures and tables on this email.

Will you be able to pay 600 Euro, as soon as possible.

If yes, I will be able to plan publication in the forthcoming issue of Acta Neuropsychologica, that is 22(1) 2024.

However, it must be a payment NOT by the **Bank of Africa**. The money from this Bank are immediately withdrawn from the Publisher Bank due to suspected '**money laundering**', and the Publisher will withdraw the publication,

I am waiting to hear from you and we will proceed your paper ASAP.

Speaking of which, we need address and data of person or institution

which will pay for this article, so the Publisher may write the Invoice or maybe *you can also pay for publisher account*.

Data for the payment:

- *the complete address of the bank:*

Getin Noble Bank S.A. (name of the bank)
Rondo Ignacego Daszyńskiego 2C
00-843 Warszawa (Warsaw)
Polska (Poland)

- *the name of the owner of the account:*

Agencja Wydawnicza MEDSPORTPRESS Sp. z o.o.
Jagiellonska street 47/20
03-301 Warsaw (Poland)

- *the IBAN account number:*

PL 68 1560 0013 2193 3380 1000 0012
"PL" that's IBAN

- *the SWIFT/BIC code:* GBGCPLPK

Warm regards,

Prof. Maria M. Pachalska, M.D., Ph.D.
Editor-in-chief of Acta Neuropsychologica

www.actaneuropsychologica.com

Dnia 04 listopada 2023 03:53 Margaretha Sih Setija Utami <cicuh@unika.ac.id> napisal(a):

Dear Maria Pachalska
 President, Polish Neuropsychological Society, Cracow, Poland
 I am Margaretha Sih Setija Utami, the first author of an article titled Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability. I have sent the article to Acta Neuropsychologica Journal and I got notification that my article was submitted on 13th April 2023. We are waiting for the progress of my article.
 Would you like to inform me what I should do to get my article published?
 I am waiting for your reply.

List of notifications Creation dates in descending order

Reference number	Created on	Receiver	Title	
#ICIP40464 <input checked="" type="checkbox"/>	05:19 13.04.2023	Utami Margaretha cicuh@unika.ac.id	Submission confirmation/Potwierdzenie przyjecia manuskryptu ID: 40464	Details

(RECORDS: 1 - 1 FROM 1, PAGE: 1/1) < > 50

List of notifications Creation dates in descending order

Reference number	Created on	Receiver	Title	
#ICIP40464 <input checked="" type="checkbox"/>	05:19 13.04.2023	Utami Margaretha cicuh@unika.ac.id	Submission confirmation/Potwierdzenie przyjecia manuskryptu ID: 40464	Details

(RECORDS: 1 - 1 FROM 1, PAGE: 1/1) < > 50

Subject: Submission confirmation/Potwierdzenie przyjecia manuskryptu ID: 40464
 Receiver: Utami Margaretha [cicuh@unika.ac.id]

Submission confirmation - Notification from the ICI Publishers Panel system

Submission confirmation

Manuscript: #40464
 Title: Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability
 Authors: Utami Margaretha Sih Setija, Sulastri Augustina, Santoso Justinus Budi, Suryani Angela Oktavia, Goeritno Haryo, Widhianingtanti Lucia Trisni, van Luijteleaar Gilles
 Date: 10/04/2023

Dear Author,
 Thank you for submitting Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability. We will now verify whether it fits our Journal's scope and check the completeness of the information we need in order to evaluate and publish your manuscript. Whenever you wish to check its status, sign in to your account at [ICI Publishers Panel](#).

Yours faithfully,
 Acta Neuropsychologica

Best regards,
 Margaretha Sih Setija Utami
 - Powered by [unika.ac.id](#) mail service



Margaretha Sih Setija Utami <cicih@unika.ac.id>

Confirmation about the notification in Acta Neuropsychologica web

Margaretha Sih Setija Utami <cicih@unika.ac.id>
To: neuropsychologia23 <neuropsychologia23@o2.pl>

Mon, Nov 6, 2023 at 4:54 PM

Dear Prof. Maria M. Pachalska, M.D., Ph.D.
Editor-in-chief of Acta Neuropsychologica

I want to ask you about the notification of my article on the web of Acta Neuropsychologica. There is no change in the notification before and after you send emails to me (see attachment). Do you have any clarification about that?

Best regards,
Margaretha Sih Setija Utami

--
- Powered by unika.ac.id mail service

 **2023 11 06 Editorial Publishers Panel.pdf**
197K



Margaretha Sih Setija Utami <cicih@unika.ac.id>

Invoice for 600 EURO


neuropsychologia23 <neuropsychologia23@o2.pl>
To: cicih <cicih@unika.ac.id>

Mon, Nov 6, 2023 at 3:20 PM

Dear Author.

I am sending you the Invoice for 600 Euro. After payment, kindly send me a copy.
We will then begin to process the article immediately.
Warm regards,

Prof. Maria M. Pachalska, M.D., Ph.D.
Editor-in-chief of Acta Neuropsychologica

 **F-ra 2.11.23 SIH SETIJA AN.pdf**
183K



Margaretha Sih Setija Utami <cicih@unika.ac.id>

Invoice for 600 EURO

Margaretha Sih Setija Utami <cicih@unika.ac.id>
To: neuropsychologia23 <neuropsychologia23@o2.pl>

Mon, Nov 6, 2023 at 4:43 PM

Dear Prof. Maria M. Pachalska, M.D., Ph.D.
Editor-in-chief of Acta Neuropsychologica
I have transferred the money (see the attachment).

Best regards,
Dr. Margaretha Sih Setija Utami, M.Kes
[Quoted text hidden]

--
- Powered by unika.ac.id mail service



2023 11 06 Proof of payment of publishing article Adaptation of Rey Auditory Verbal Learning Test.jpeg
156K

Manuscript accepted/Manuskrypt zaakceptowany (ID: 40464)

editors@publisherspanel.com <editors@publisherspanel.com>
Reply-To: editors@publisherspanel.com
To: Utami Margaretha <cicih@unika.ac.id>

Fri, Nov 10, 2023 at 5:43 PM

Powiadomienie z systemu ICI Publisher Panel
Manuscript accepted/Manuskrypt zaakceptowany (ID: 40464)

Notification from the ICI Publishers Panel system**Manuscript #40464 has been accepted**

Manuscript: #40464
Title: *Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability*
Authors: Utami Margaretha Sih Setija, Sulastris Augustina, Santoso Justinus Budi, Suryani Angela Oktavia, Goeritno Haryo, Widhianingtanti Lucia Trisni, van Lujtelaar Gilles
Date: 10/04/2023

Dear Author,

We are glad to inform you that your manuscript has recently been accepted and would be now sent for review. Whenever you wish to check it's status, sign in to your account at [ICI Publishers Panel](#) system.

Yours faithfully,
Acta Neuropsychologica

Powiadomienie z systemu ICI Publishers Panel**Manuskrypt nr #40464 został zaakceptowany**

Manuskrypt: #40464
Tytuł: *Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability*
Autorzy: Utami Margaretha Sih Setija, Sulastris Augustina, Santoso Justinus Budi, Suryani Angela Oktavia, Goeritno Haryo, Widhianingtanti Lucia Trisni, van Lujtelaar Gilles
Data: 10/04/2023

Szanowny Autorze,

Uprzejmie informujemy, że manuskrypt *Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability* został zaakceptowany i zostanie poddany recenzji. Aby poznać więcej szczegółów należy zalogować się w [ICI Publishers Panel](#) i odnaleźć manuskrypt w zakładce Artykuły naukowe/Manuskrypty.

Z wyrazami szacunku,
Acta Neuropsychologica

Manuscript accepted after review/Manuskrypt zaakceptowany po recenzji (ID: 40464)

editors@publisherspanel.com <editors@publisherspanel.com>
Reply-To: editors@publisherspanel.com
To: Utami Margaretha Sih Setija <cicih@unika.ac.id>

Fri, Nov 10, 2023 at 5:45 PM

Powiadomienie z systemu ICI Publisher Panel
Manuscript accepted after review/Manuskrypt zaakceptowany po recenzji (ID: 40464)

Notification from the ICI Publishers Panel system**Manuscript #40464 has been accepted after review**

Manuscript: #40464
Title: *Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability*
Authors: Utami Margaretha Sih Setija, Sulastris Augustina, Santoso Justinus Budi, Suryani Angela Oktavia, Goeritno Haryo, Widhianingtanti Lucia Trisni, van Lujtelaar Gilles
Date: 10/04/2023

Dear Author,

We are glad to inform you that your manuscript *Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability* has been accepted for publication. To find more details, sign in to your ICI Publishers Panel and find the manuscript in Scientific articles/Manuscripts section.

Yours faithfully,
Acta Neuropsychologica

Powiadomienie z systemu ICI Publishers Panel**Manuskrypt nr #40464 został zaakceptowany po recenzji**

Manuskrypt: #40464
Tytuł: *Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability*
Autorzy: Utami Margaretha Sih Setija, Sulastris Augustina, Santoso Justinus Budi, Suryani Angela Oktavia, Goeritno Haryo, Widhianingtanti Lucia Trisni, van Lujtelaar Gilles
Data: 10/04/2023

Szanowny Autorze,

Uprzejmie informujemy, że manuskrypt *Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability* został zaakceptowany do publikacji. Aby poznać więcej szczegółów należy zalogować się w ICI Publishers Panel i odnaleźć manuskrypt w zakładce Artykuły naukowe/Manuskrypty.

Z wyrazami szacunku,
Acta Neuropsychologica



Margaretha Sih Setija Utami <cicih@unika.ac.id>

AN 22(1)2024 UTAMI et al

neuropsychologia23 <neuropsychologia23@o2.pl>
To: cicih <cicih@unika.ac.id>


Tue, Feb 6, 2024 at 3:19 PM

Dear Dr Margaretha Sih Setija Utami,

Here is your article in the final version for printing,
Please make the necessary corrections if needed, of course (mark them in red) and resend it to me.
We are starting the composition of this article.

Warm regards,
Prof. Maria M. Pachalska, M.D., Ph.D.
Editor-in-chief of Acta Neuropsychologica

www.actaneuropsychologica.com

 **AN 22_1_2024 UTAMI.docx**
290K



Margaretha Sih Setija Utami <cicih@unika.ac.id>

AN 22(1)2024 UTAMI et al

Margaretha Sih Setija Utami <cicih@unika.ac.id>
To: neuropsychologia23 <neuropsychologia23@o2.pl>

Tue, Feb 6, 2024 at 5:45 PM

Thank you very much for your email. May I know the deadline for the corrections?

Warm regards,
Margaretha Sih Setija Utami

[Quoted text hidden]

—

- Powered by unika.ac.id mail service



Margaretha Sih Setija Utami <cicih@unika.ac.id>

AN 22(1)2024 UTAMI et al

neuropsychologia23 <neuropsychologia23@o2.pl>
To: Margaretha Sih Setija Utami <cicih@unika.ac.id>

Wed, Feb 7, 2024 at 10:51 AM

Dear Margaretha,

It depends on you how much time you need.
Howeverm if you want me to classify the article for Acta Neuropsychologica 22(1)2024 (which I am finishinbg now) you have to send me a correction by Jan. 8, 2024.

I have to send the article for typesetting.

If you do not care about fast printing, you have 3-4 weeks. However, the article will publish in Acta Neuropsychologica 22(2)2024.

Please, let me know your decision.

Warm regards,
Prof. Maria M. Pachalska, MD., Ph.D.
Editor-in-chief of Acta Neuropsychologica
[Quoted text hidden]



Margaretha Sih Setija Utami <cicih@unika.ac.id>

The Revision of artikel by Utami et al

Margaretha Sih Setija Utami <cicih@unika.ac.id>

Fri, Feb 9, 2024 at 1:40 AM


To: neuropsychologia23 <neuropsychologia23@o2.pl>, "Luijtelaar, E.L.J.M. van (Gilles)" <g.vanluijtelaar@donders.ru.nl>, AUGUSTINA SULASTRI <ag.sulastri@unika.ac.id>, Justinus Budi Santoso <justinus.budi@atmajaya.ac.id>, Angela Suryani <angela.suryani@atmajaya.ac.id>, Haryo Goeritno <caturjuli@yahoo.co.id>, LUCIA TRISNI WIDIANINGTANTI <trisni@unika.ac.id>

Dear Prof. Maria M. Pachalska, M.D., Ph.D.
Editor-in-chief of Acta Neuropsychologica,

Herewith I send you the revision of our article titled Adaptation of Rey Auditory Verbal Learning Test for Indonesia: its Validity and Reliability. I hope you receive it well.

Best regards,
Margaretha Sih Setija Utami.

- Powered by unika.ac.id mail service

 2024 02 08 Revision of Utami et al Adaptation of RAVLT.docx
278K



Margaretha Sih Setija Utami <cicih@unika.ac.id>

Acta Neuropsychologica 22(1)2024 UTAMI et al

neuropsychologia23 <neuropsychologia23@o2.pl>
To: Margaretha Sih Setija Utami <cicih@unika.ac.id>

Mon, Feb 19, 2024 at 3:41 PM

Dear Margaretha,

I am sending you the proofs of your article.

It is very good paper. Congratulations.

Please correct it, if necessary of course, and accept it for publication in Acta Neuropsychologica 22(1)2024

Warm regards,
Maria,

--

Prof. Maria M. Pachalska, M.D., Ph.D.
Editor-in-chief of Acta Neuropsychologica

www.actaneuropsychologica.com

 2 Utami.pdf
1414K

Acta Neuropsychologica 22(1)2024 UTAMI et al

Margaretha Sih Setija Utami <cicuh@unika.ac.id>
To: neuropsychologia23 <neuropsychologia23@o2.pl>

Tue, Feb 20, 2024 at 12:59 PM

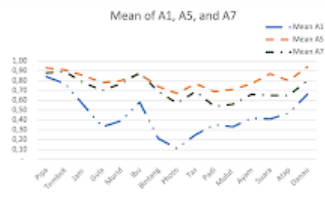
Dear Prof. Maria M. Pachalska, M.D., Ph.D.

Thank you for your email. I am sorry because we found some mistakes that should be corrected. I am sending you the notes of our corrections. I hope it will make our article better. Thank you

Best regards,
Margaretha Sih Setija Utami


[Quoted text hidden]

[Quoted text hidden]

3 attachments

2024 02 20 Revision of Figure 2 Mean A1 A5 A7.png
178K

 **2024 02 20 Proofs Utami et al 2024.docx**
20K

 **2024 02 19 2 Utami (2).pdf**
1556K



Margaretha Sih Setija Utami <cicih@unika.ac.id>

Acta Neuropsychologica 22(1)2024 UTAMI et al

neuropsychologia23 <neuropsychologia23@o2.pl>
To: Margaretha Sih Setija Utami <cicih@unika.ac.id>

Tue, Feb 20, 2024 at 1:50 PM

Dear Author,

Our technical Editor is asking how to correct (version 1 or 2)

IT IS:
Maranatha Christian University, Bandung, Indonesia

IT SHOULD BE: version 1
Maranatha Christian University, **Faculty of Psychology**, Bandung, Indonesia

IT SHOULD BE: version 2
Faculty of Psychology, Maranatha Christian University, Bandung, Indonesia
[Quoted text hidden]



Margaretha Sih Setija Utami <cicih@unika.ac.id>

Acta Neuropsychologica 22(1)2024 UTAMI et al

Margaretha Sih Setija Utami <cicih@unika.ac.id>

Tue, Feb 20, 2024 at 6:54 PM

To: neuropsychologia23 <neuropsychologia23@o2.pl>

Thank you for your email. We prefer version 2 but after "Faculty of Psychology" it should be one coma. It should be: "Faculty of Psychology, Maranatha Christian University, Bandung, Indonesia."

Thank you.

[Quoted text hidden]



Margaretha Sih Setija Utami <cicih@unika.ac.id>

Afer correction___Acta Neuropsychologica 22(1)2024 UTAMI et al

neuropsychologia23 <neuropsychologia23@o2.pl>
To: Margaretha Sih Setija Utami <cicih@unika.ac.id>


Fri, Feb 23, 2024 at 12:20 AM

Dear Professor Margaretha Sih Setija Utami

I am sending you the article after correction.
Please accept it for publication in Acta Neuropsychologica 22(1)2024.

Warm regards,
Prof. Maria M. Pachalska, M.D., Ph.D.
Editor-in-chief of Acta Neuropsychologica

www.actaneuropsychologica.com

 **2 Utami.pdf**
16180K

Afer correction___Acta Neuropsychologica 22(1)2024 UTAMI et al

Margaretha Sih Setija Utami <cicih@unika.ac.id>
To: neuropsychologia23 <neuropsychologia23@o2.pl>

Tue, Feb 27, 2024 at 5:43 AM

Dear Prof. Maria M. Pachalska, M.D., Ph.D.
Editor-in-chief of Acta Neuropsychologica,

Thank you for your email. I am happy our article will be published soon.
But we still find small mistakes. Here we suggested our revision. We expect it is our last revision and will be published in Acta Neuropsychologica 22(1)2024.

In the summary

- It contains two almost identical sentences: "We tested the validity via its seven recall trials ...etc." I think that one time is enough. I hope you would like to delete the sentence in yellow color.
- Cronbach's alpha is two times written as alpha and once as Alpha. The first one is in the lowercase letter, and the second one is in the uppercase letter. Would you like to change the "a" to "A"?

SUMMARY

Background:	Rey's Auditory Verbal Learning Test (RAVLT) assesses different aspects of verbal memory and learning. This test is often used in clinical, educational, and selection contexts. We adapted the Geffen et al' version for Indonesia and here we present its psychometric properties. We tested the validity via its seven recall trials (A1 to A7), based on theoretical constructs (e.g. the presence and recency effect) via analyses of variance and factor analyses and the test's reliability via e.g. correlation analyses and Cronbach's alpha.
Material/ Methods:	Two groups of healthy participants with varying ages (16-80) and education (from Elementary school to postgraduate alumni) included 492 persons for the validation, and 50 for the test-retest reliability part of the study with a 6–14-day interval. We tested the validity via its seven recall trials, based on theoretical constructs, and factor analyses. The test's reliability via Cronbach's alpha test, and test-retest
Results:	The recall scores increased over trials A1 to A5. The expected position effect, primacy, and recency were found for A1 to A5. Factor analysis of Rey's Auditory Verbal Learning Test revealed three memory constructs. The word "ibu (mother)" caused an anomaly in the position effect of the 15 words. Both Cronbach's Alpha and the test-retest correlations increased from low A1 to satisfying A7. Carry-over results were found in the retest.

Thank you

Warm regards,
Margaretha Sih Setija Utami

[Quoted text hidden]

[Quoted text hidden]

 2024 02 27 The Last Revision of Utami et al.docx
253K



Margaretha Sih Setija Utami <cicih@unika.ac.id>

Published__Acta Neuropsychologica 22(1)2024 UTAMI et al

neuropsychologia23 <neuropsychologia23@o2.pl>
To: Margaretha Sih Setija Utami <cicih@unika.ac.id>

Thu, Feb 29, 2024 at 11:10 PM

Dear Professor Margaretha Sih Setija Utami,

Your article is published after two autorial correction.
The Publisher send it to the page.

Warm regards,

Prof. Maria M. Pachalska, M.D., Ph.D.
Editor-in-chief of Acta Neuropsychologica
www.actaneuropsychologica.com

2 attachments

SUMMARY

Background: Ray's Auditory Verbal Learning Test (RAVLT) assesses different aspects of verbal memory and learning. This test is often used in clinical, educational, and selection contexts. We adapted the Gierler et al. version for Indonesian and have now prepared its psychometric properties. We tested the validity via its internal consistency (Cronbach's α), based on three trial conditions, e.g., the retention and memory effect via analysis of variance and factor analysis, and the test-retest reliability via a 14-day interval.

Material/ Methods: Two groups of healthy participants with varying ages (16-60) and education (from Elementary school to postgraduate alumni) included 450 persons for the validation, and 50 for the test-retest reliability part of the study with a 0-14-day interval. We tested the validity via its internal consistency, based on theoretical constructs, and factor analysis. The test's reliability via Cronbach's α , test-retest, and intraclass correlation coefficient (ICC) was tested.

Results: The result scores increased over trials (A1 to A5). The expected position effect, primacy, and recency were found for A1 to A5. Factor analysis of Ray's Auditory Verbal Learning Test revealed three primary constructs. The word 'bu (brother)' caused an anomaly in the position effect of the 10 words. Both Cronbach's α and the test-retest correlations increased from low A1 to testing A5. Carryover results were found in the retest.

image.png
388K

2 Utami.pdf
16180K



Margaretha Sih Setija Utami <cicih@unika.ac.id>

Published__Acta Neuropsychologica 22(1)2024 UTAMI et al

Margaretha Sih Setija Utami <cicih@unika.ac.id>
To: neuropsychologia23 <neuropsychologia23@o2.pl>

Sat, Mar 2, 2024 at 11:17 AM

Dear Prof. Maria M. Pachalska, M.D., Ph.D.
Editor-in-chief of Acta Neuropsychologica

Thank you very much for publishing my article. I hope the article will be useful for readers.

Best regards

Margaretha Sih Setija Utami

[Quoted text hidden]

--

- Powered by unika.ac.id mail service



Margaretha Sih Setija Utami <cicih@unika.ac.id>

2_AN 22(1)2024 Utami wt al...

neuropsychologia23 <neuropsychologia23@o2.pl>
To: Margaretha Sih Setija Utami <cicih@unika.ac.id>

Thu, Mar 7, 2024 at 7:26 PM

Hi again,
It is corrected (in odf and in the page)/

It was several times:
Cronbach Alpha

It is now:

Cronbach alpha [in the entire article]

The fragment *We tested...* in the opinion of the reviewer... **should stay**.

Warm regards,

Prof. Maria M. Pachalska, MD., Ph.D.,
Editor-in-chief of Acta Neuropsychologica

www.actaneuropsychologica.com

 **2-Utami (4).pdf**
16180K



Margaretha Sih Setija Utami <cicih@unika.ac.id>

2_AN 22(1)2024 Utami wt al...

Margaretha Sih Setija Utami <cicih@unika.ac.id>
To: neuropsychologia23 <neuropsychologia23@o2.pl>

Thu, Mar 7, 2024 at 9:54 PM

Thank you. I am happy to know it.

Warm regards,
Margaretha Sih Setija Utami






[Quoted text hidden]

[Quoted text hidden]

Received: 11.09.2023
Accepted: 10.02.2024

A – Study Design
B – Data Collection
C – Statistical Analysis
D – Data Interpretation
E – Manuscript Preparation
F – Literature Search
G – Funds Collection

ADAPTATION OF REY AUDITORY VERBAL LEARNING TEST FOR INDONESIA: ITS VALIDITY AND RELIABILITY

Margaretha Sih Setija Utami¹ [A,C,D,E,G] 
Augustina Sulastri¹ [A,B,D,E,F,G] 
Justinus Budi Santoso² [C,D] 
Angela Oktaviani Suryani² [C,D] 
Haryo Goeritno¹ [C,D] 
Lucia Trisni Widhianingtanti¹ [B,C,D] 
Gilles van Luijtelaar^{3,4} [C,D,E] 

¹ Faculty of Psychology, Soegijapranata Catholic University, Indonesia,

² Faculty of Psychology, Atma Jaya Catholic University of Indonesia, Indonesia

³ Donders Centre of Cognition, Radboud University, Nijmegen, the Netherlands

⁴ Faculty of Psychology, Maranatha Christian University, Bandung, Indonesia

SUMMARY

Background:

Rey's Auditory Verbal Learning Test (RAVLT) assesses different aspects of verbal memory and learning. This test is often used in clinical, educational, and selection contexts. We adapted the Geffen et al' version for Indonesia and here we present its psychometric properties. We tested the validity via its seven recall trials (A1 to A7), based on theoretical constructs (e.g. the presence and recency effect) via analyses of variance and factor analyses and the test's reliability via e.g. correlation analyses and Cronbach's alpha.

Material/ Methods:

Two groups of healthy participants with varying ages (16-80) and education (from Elementary school to postgraduate alumni) included 492 persons for the validation, and 50 for the test-retest reliability part of the study with a 6–14-day interval. We tested the validity via its seven recall trials, based on theoretical constructs, and factor analyses. The test's reliability via Cronbach's alpha test, and test-retest

Results:

The recall scores increased over trials A1 to A5. The expected position effect, primacy, and recency were found for A1 to A5. Factor analysis of Rey's Auditory Verbal Learning Test revealed three memory constructs. The word "ibu (mother)" caused an anomaly in the position effect of the 15 words. Both Cronbach's Alpha and the test-retest correlations increased from low A1 to satisfying A7. Carry-over results were found in the retest.

Conclusions:

The Indonesian version of Rey's Auditory Verbal Learning Test is valid based on the position effect of the recall score and the three clusters covering different aspects of memorizing the items over the seven trials. The score of reliability is only moderate for the recall score, it might be due to the test-retest procedure.

Key words: validity, reliability, primacy, recency effect, verbal auditory learning, memory

INTRODUCTION

Assessment of memory of patients with neurological symptoms can be done either with a clinical examination (Cooper & Greene, 2005; Kipps & Hodges, 2005) or with objective standardized, well validated, and reliable neuropsychological tests (Schroeder et al., 2019). Standardized tests are often used and are needed in clinical practice to corroborate clinical assessment, support diagnosis, and guide interventions (Nielsen et al., 2018). Rey's Auditory Verbal Learning Test (RAVLT) is an often-used verbal learning and memory test (Groth-Marnat, 2003; Neblina, 2012; Cromer et al., 2013; Fard et al., 2016; de Paula et al., 2012). The first version of the RAVLT was developed by Andre Rey in French (1958). Taylor (1959) developed the first English version, followed by Lezak (1976). In the following years, various versions of the RAVLT were developed, including various English versions (Hawkins et al., 2004). Apart from the English versions, other versions exist around the world, e.g., a Greek, Spanish, Japanese and a Farsi version (Messinis et al., 2007; Neblina, 2012; Cromer et al., 2013; Fard et al., 2016). Some of these versions are merely translations of the English words, and there are differences between the versions regarding the number of syllables or phonemes, frequency of use in a language, or some of the words were adapted and replaced because of frequency of usage, or difficulties in pronunciation (Alvarez-Schulze et al., 2022; de Paula et al., 2012; Vlahou et al., 2013).

The test refers to the ability to acquire new verbal information, the improvement over trials, the storage of this newly acquired information first in short-term and subsequently in long-term memory and the ability to retrieve this stored information (Kessels & Hendriks, 2016; Henke, 2010; Baddeley, 2012). The RAVLT measures learning and memory by the acquisition and retention of a list of fifteen repeatedly presented words (Word list A). This list is presented five times and the client must recall the words after each presentation. Then another list of words (Word list B) is presented followed by a sixth recall trial and after about 20 minutes a final recall is measured. Next, in the recognition phase, participants are asked to mark the 30 words of word list A and B from a list of fifty words visually presented, including also twenty new words that were not previously presented.

The RAVLT is useful to differentiate between different types of memory deficits and as such, it is a viable tool to assess memory impairments in individuals at risk (Zeidman et al., 2008; Schoenberg et al., 2006). It is considered an important instrument to assess patients with psychoneurological complaints since the test is sensitive to memory impairments due to a wide variety of neurological causes, such as traumatic brain injury (Callahan & Johnstone, 1994), different types of dementia (Tierney et al., 2010), as well as psychiatric disorders such as depression and schizophrenia, post-traumatic stress, and anxiety disorders (Badcock et al., 2011; Gooren et al., 2013).

While previous findings support the utility of the RAVLT in clinical settings, its adaptation to the Indonesian language has now become imperative. As of the writing of this article, no specific test for auditory memory has been adapted for

Indonesia. Two previous studies have used the RAVLT in Indonesia prior to this study (Maharani, 2015; Widyastuti et al., 2016). However, these studies were part of another research that did not specifically aim to adapt the RAVLT. Therefore, to date, there is no study reporting the adapted and validated RAVLT in Bahasa Indonesia. Adaptation is important since cultural differences may have an impact on the meaning or familiarity of words and may affect the way test-takers memorize and respond to the words. And this is an obvious reason for the replacement of some words. The replacement and differences in word choice may have consequences for its psychometric properties. Therefore, a detailed description of the translation of the RAVLT to Indonesian language will help future comparison of measurements using the RAVLT in Indonesian samples with similar measurements from other languages or cultures. We report here the adaptation process including the translations for the Indonesian language. This includes a clear description of the translation process. The version of RAVLT we used was adapted from Geffen's version (1994) by Hendriks et al. (2016). Next, we aimed to analyze the validity and reliability of the Indonesian version of the RAVLT.

Previous studies have investigated the validity of RAVLT with several other learning and memory tests. Moderate correlations were reported between the RAVLT and other similar measures, including subtests of the WMS-R (Pliskin et al., 2021; Wiens et al., 1994; Stallings et al., 1995; Johnstone et al., 2000). Besides that, factor analysis has shown that the variables of the RAVLT have high loadings on the same factor as similar variables from other verbal memory tests, including the subtests of WMS-R (Johnstone et al., 2000) and the California Verbal Learning Test (Wiens et al., 1994; Stallings et al., 1995).

Altmann (2000) and Capitani et al. (1992) stated that when a set of items are presented for memorization, an association between an item and other items will occur due to the way the items are presented. Although the possibility to form associations between words based on their meaning is an important feature in remembering, the serial position of a word in the list is also relevant for the probability of remembering a word in a list (Capitani et al., 1992). There is abundant evidence for the tendency for subjects to recall rather better the early items (primacy effect) and the late items (recency effect) in a list of words than words from the middle of the list. The first five items tend to be easier to recall, perhaps due to a lack of or less interfering associations with previous words. The middle group of words might be the most difficult to remember, because humans tend to associate these with the words presented before and after them. The last group of words tend to be easier to recall because there is no or less association with words after them. Due to these effects, the first and last group of fifteen words should be easier to recall compared to the middle group of words and this primacy and recency effect were often replicated (Gavett & Horwitz, 2012; Martín et al., 2013; Morrison et al., 2018; Griffin et al., 2017; Lima et al., 2019). We used the presence of a primacy and recency effect as one of the ways to validate the for Indonesia adapted version of the RAVLT. The validity was also established via exploratory factor analysis (EFA) of the recall scores. EFA studies analyzing

A1 to A7 have identified three or four different clusters, an initial one comprising either 2 or 3 trials, a second one, and one or two clusters for trial 6 and 7 (post distraction and delayed recall) (Nordanskog et al., 2014; Geffen et al., 1994; de Paula et al., 2012). The reliability of the adapted RAVLT was determined by its internal consistency and by the test-retest method.

MATERIAL & METHODS

Participants

This study used two groups of participants. The first group consisted of 492 participants. Data gathered from these participants were used to test the chosen words and to establish the validity of trials A1, A2, A3, A4, A5, A6, A7 as valid learning and memory parameters and to calculate *Cronbach's Alpha Reliability coefficient*. Data gathered from the second group (N= 50) were used for the test-retest reliability. Participants in both groups were healthy adults living in urbanized areas in West, Central and East Java. Java island was chosen because it has the highest population (59%) of the total of 272 million Indonesian inhabitants (Badan-Pusat-Statistik, 2021).

All participants (the first and second group) gave their consent to get involved in the study. The second group of the participants agreed to be assessed twice. The second test was delivered in the interval of 7 to 15 days from the first test. The current research was conducted in accordance with the Declaration of Helsinki and the ethics committee of Soegijapranata University granted permission for this research project (University Ethical Clearance number: 001B/B.7.5/FP. KEP/IV/2018). Database design and transport and storage of sensitive personal information complies with Indonesian regulations as stated in ITE (Electronic Information and Transactions).

The range of years of education of the participants varied between 6 and 22 years ($M = 13.99$; $SD = 2.80$) and is grouped into five categories of education according to the natural division of the Indonesian education system, namely: (i) less than seven years (Elementary School), (ii) between 7-9 years (Junior High School), (iii) between 10-12 years (Senior High School or equivalent), (iv) between 13-16 years, undergraduate level (UG) or equivalent, and (v) above 17 years, postgraduate (PG).

Participants received financial compensation after completing a full series of neuropsychological tests. RAVLT is one of a series of neuropsychological tests given to each participant related to a larger project, namely the adaptation of a neuropsychological test battery of 10 subtests involving healthy people in Indonesia. All participants were not reported to have a history of psychiatric or neurological illness, head trauma, drug abuse, or other illness that could affect their test performance.

The entire process of data collection was carried out by research assistants. The research assistants were recruited based on specific criteria related to expertise in administering psychological tests. Before the data collection process

Table 1. Characteristics of the participants regarding level of Education, Age, and Sex

Variables	Category	Frequency (N=492)	%
Education	0-6	15	3.00
	7-9	33	6.70
	10-12	156	31.16
	13-16	267	54.30
	17-22	21	4.30
	Total	492	100.00
Age	16-19	63	12.80
	20-29	203	41.30
	30-39	73	14.80
	40-49	57	11.60
	50-59	66	13.40
	60-69	22	4.50
	70-highest	8	1.60
Total	492	100.00	
Sex	Female	295	60.00
	Male	197	40.00
	Total	492	100.00

was carried out, the research assistants received training on how to administer the entire neuropsychological test battery, and the data input process.

The RAVLT instructions were implemented in the official Indonesian language, Bahasa Indonesia. Before the test was administered, the assistant researcher explained the research procedure and informed the participants that the data would be used for scientific purposes.

A separate group of subjects were included in the data collection for the test-retest part of the study. Only the RAVLT test was administered. One week to 15 days later, the procedure repeated with the same version of the RAVLT.

Measurements

The RAVLT used in this study originated from (Geffen et al., 1994). There were two-word lists, A and B, each containing fifteen words. The tester read aloud the fifteen words from list A, see Table 2, at a rate of word per second. The participants were asked to recall as many words as possible, not necessarily in the same order. This was repeated five times (trial 1 to 5 with scores referred to A1 to A5) with the same words, in the same sequence and the same speed. Next, the tester read aloud the words from list B, see Table 3, the recall score of the participant refers to B1. The next stage, the participant was asked to reiterate the words from list A, (A6). After being given a pause of twenty minutes, filled with other tests, the participant was asked to recall once more the words from list A, which was then referred to as A7. Finally, the participant is then asked to read a list of fifty words (containing all words from list A and B, plus another twenty new words) and is asked to indicate whether the words were earlier presented, the number of correctly identified items is the recognition score.

Table 2. The Fifteen Words of the wordlists A and B

Word list A	A1	A2	A3	A4	A5	Word list B	B1	A6	A7
Pipa						Kursi			
Tembok						Satpam			
Jam						Kandang			
Gula						Sandal			
Murid						Kulkas			
Ibu						Gunung			
Bintang						Botol			
Foto						Sabun			
Tas						Awan			
Padi						Kapal			
Mulut						Domba			
Ayam						Bom			
Suara						Kertas			
Atap						Aula			
Danau						Udang			

Table 3. Recognition Sheet

Jam	Mata	Sabun	Kapal	Botol
Tante	Udang	Tembok	Kentang	Bangku
Tas	Bintang	Waktu	Ibu	Sandal
Sungai	Jas	Suara	Bebek	Bunyi
Satpam	Udara	Kursi	Padi	Kulkas
Mulut	Kandang	Bom	Kitab	Batu
Pistol	Gunung	Malam	Awan	Beras
Murid	Gula	Aula	Atap	Pipa
Gembok	Bangau	Ayam	Tugas	Bola
Kertas	Danau	Lomba	Foto	Domba

Statistical Analyses

The evaluation of the validity of the RAVLT was started by the analyses of the probability of the recall of each of the words. More specifically, we examined whether the probability of correct retrieved words was in agreement with what could be expected based on the theory regarding the presence of a primacy and recency effect. In order to do so, the probability of occurring of the first five words, the second five words (6th to 10th) and last five words were compared. We expected that a curve representing this would take the shape of the letter “U” curve, that is the five words at the beginning and the five words at the end of a list would have a larger probability to be remembered than words in the middle part (Rezvanfard et al., 2011). We tested this with repeated measures one-way ANOVA followed by post-hoc tests.

Subsequently, we implemented an Exploratory Factor Analysis (EFA) to identify the structure of dimensions of the seven recall trials. The structure of a psychological construct known as a system involves dimension(s), factor(s), or latent variable(s) from a set of inter-correlated data (Watkins, 2018) to help researchers to formulate the constructs that underlie the observed scores. Geffen et al. (1994) classified the first three trials (A1-A3) as “acquisition trials,” whereas the second group, namely trials four (A4) and five (A5), specifically as “later acquisition trials,” while trial six (A6) as “post distractor trial,” and trial seven (A7) as “delayed trial.”

In the last step, we test the instrument’s reliability by implementing the internal consistency method, namely Cronbach’s Alpha and by the test-retest reliability. Internal consistency would provide evidence of whether there are consistent responses across trials since repetition was involved in the learning process. Test-retest reliability delivered an indicator of the stability of a test over time. The basic assumption of test-retest reliability is that the constructs measured by a test do not change over time. The interval between testing should be enough to prevent the memory of the first testing from affecting the test takers’ scores in the second testing (Bolarinwa, 2015).

RESULTS

The translation and adaptation for Indonesians

We translated and adapted the words in the RAVLT written by (Geffen et al., 1994) (see Table 4) based on the following considerations, namely direct translation from English, its meaning (rather than the number of syllables/ pronunciations/phonemes of the words), and the familiarity of the terms for Indonesians. The selected words from the latest consideration came from the same group or type of words in the English version. For example, “wheat” in the original version was adapted as “padi” in Bahasa Indonesia, which means “rice” in English, because Indonesians are more familiar with rice than wheat as daily meals. None of the words had more than two syllables and were easily pronounceable for Bahasa speaking persons.

Table 4. The Translation Version of Geffen et al. (1994) to the Indonesian version

No.	Words of group A			Words of Group B		
	Geffen et al (1994)	Bahasa Indonesia	Back-translation	Geffen et al. (1994)	Bahasa Indonesia	Back-translation
1.	Pipe	Pipa	Pipe	Bench	Kursi	Chair
2.	Wall	Tembok	Wall	Officer	Satpam	Security guard
3.	Alarm	Jam	Clock	Cage	Kandang	Cage
4.	Sugar	Gula	Sugar	Sock	Sandal	Slipper
5.	Student	Murid	Student	Fridge	Kulkas	Fridge
6.	Mother	Ibu	Mother	Cliff	Gunung	Mountain
7.	Star	Bintang	Star	Bottle	Botol	Bottle
8.	Painting	Photo	Photo	Soap	Sabun	Soap
9.	Bag	Tas	Bag	Sky	Awan	Clouds
10.	Wheat	Padi	Rice	Ship	Kapal	Ship
11.	Mouth	Mulut	Mouth	Goat	Domba	Sheep
12.	Chicken	Ayam	Chicken	Bullet	Bom	Bomb
13.	Sound	Suara	Sound	Paper	Kertas	Paper
14.	Door	Atap	Roof	Chapel	Aula	Hall
15.	Stream	Danau	Lake	Crab	Udang	Shrimp

Table 5. The Proportion Per Word and Trial for Giving the Right Answer

No.	Word	Trial A1		Trial A2		Trial A3		Trial A4		Trial A5		Trial A6		Trial A7	
		Pro-portion	SD	Pro-portion	SD	Pro-portion	SD	Pro-portion	SD	Pro-portion	SD	Pro-portion	SD	Pro-portion	SD
1.	Pipa	.84	.366	.83	.377	.89	.310	.92	.270	.93	.257	.90	.302	.88	.320
2	Tembok	.77	.422	.85	.354	.88	.320	.89	.318	.91	.280	.90	.294	.89	.308
3	Jam	.55	.497	.73	.444	.78	.416	.83	.380	.85	.360	.77	.424	.78	.414
4	Gula	.33	.469	.56	.497	.67	.470	.72	.448	.78	.413	.73	.442	.70	.458
5	Murid	.39	.488	.64	.479	.74	.438	.78	.417	.80	.401	.78	.416	.77	.422
6	Ibu	.58	.495	.77	.421	.80	.400	.83	.373	.87	.334	.88	.328	.88	.323
7	Bintang	.21	.407	.42	.494	.60	.490	.68	.467	.74	.441	.68	.468	.69	.463
8	Photo	.11	.318	.27	.442	.47	.500	.61	.489	.67	.472	.59	.493	.57	.496
9	Tas	.25	.433	.45	.498	.60	.490	.75	.436	.77	.422	.66	.473	.69	.464
10	Paadi	.35	.477	.49	.500	.60	.491	.62	.486	.69	.463	.59	.492	.54	.499
11	Mulut	.33	.472	.52	.500	.58	.495	.64	.480	.71	.453	.55	.498	.56	.497
12	Ayam	.42	.494	.60	.490	.67	.472	.70	.461	.77	.422	.66	.473	.66	.475
13	Suara	.41	.493	.66	.473	.79	.410	.83	.377	.87	.332	.71	.455	.65	.478
14	Atap	.47	.500	.64	.482	.71	.454	.76	.425	.80	.397	.65	.478	.65	.479
15	Danau	.66	.473	.81	.392	.89	.315	.93	.257	.94	.232	.82	.387	.80	.401

Validity examination

The word position effect

We compared the probabilities of correct responses of the three word groups via a repeated measures one-way ANOVA for each of the trials (see Table 5 for the Proportion and the Standard Deviations of each word), for all descriptive and inferential statistics regarding group effects (first, second and third group of five words) see Table 6 and 7. The comparison testing showed a significant difference among the three groups of words, and the post-hoc analysis showed that the second group (the 6th to 10th words) always had the lowest mean and was statistically different from the means of the first and third group. This finding was consistently present across the first five trials (A1 – A5) (see Tables 6 and 7).

The statistical analyses showed that the partial eta squared in each test was more than 0.14, which means that the effect of the order of word group has a substantial impact (see Cohen in Lakens, 2013 on the meaning of the magnitude of effect size).

Trials A6 and A7 were clearly different from A1 to A5: there were no significant differences anymore between middle and recency word groups and only the primacy effect remained present during trial A6 and A7. This result was like Martín et al.'s (2013) and Griffin et al.'s (2017) on long-term memory. Figure 1 shows that the first group of word groups, representing the primacy effect, increased

Table 6. Comparing Three Groups of Words (Primacy, Middle, and Recency) from Trial A1 to Trial A7

Trials	Primacy Group (The 1 st - 5 th Words)		Middle Group (The 6 th -10 th Words)		Recency Group (The 11 th -15 th Words)		Wilks' Lambda F
	Mean	SD	Mean	SD	Mean	SD	
1	2.88	1.209	1.50	1.052	2.30	1.230	212.079**
2	3.62	1.175	2.40	1.246	3.23	1.221	180.452*
3	3.97	1.023	3.08	1.325	3.63	1.146	102.214*
4	4.13	1.016	3.48	1.251	3.86	1.116	55.614*
5	4.27	0.982	3.73	1.201	4.10	0.980	42.842*
6	4.08	1.049	3.40	1.302	3.39	1.330	97.316*
7	4.03	1.050	3.37	1.302	3.32	1.410	97.311*

Table 7. Wilks Lambda and Partial Eta Squared of Primacy, Middle, and Recency Word Groups of Trial 1-7

	Wilks' Lambda Value	Partial Eta Squared	Mean Differences (Primacy & Middle Word Groups)	Mean Differences (Primacy & Recency Word Groups)	Mean Differences (Middle & Recency Word Groups)
Trial 1	.536	.464	1.384*	0.581*	-0.803*
Trial 2	.576	.424	1.222*	0.388*	-0.833*
Trial 3	.706	.294	0.892*	0.339*	-0.553*
Trial 4	.815	.185	0.648*	0.274*	-0.374*
Trial 5	.851	.149	0.539*	0.169*	-0.370*
Trial 6	.716	.284	0.685*	0.691*	0.006
Trial 7	.716	.284	0.663*	0.713*	0.051

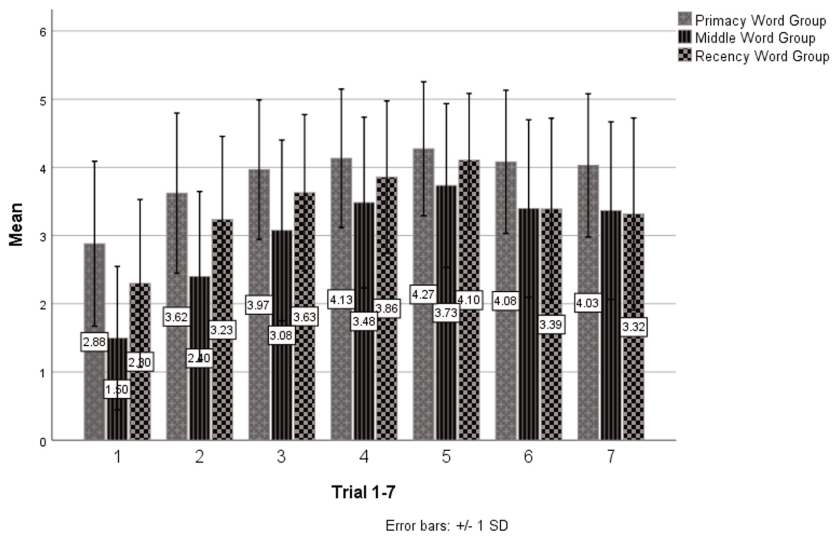


Figure 1. Mean score of each word groups across the seven trials

from A1 to A5 and decreased only slightly at A6 and A7. Similar increasing scores were seen for the middle and last group for trial A1 to A5, representing learning over trials. The decrease at A6 and A7 is larger for the middle and recency group compared to the primacy group. In fact, the recency advantage, clearly present at A1 to A5 completely disappeared at A6 and A7. Put into other words, the typical U-shape present during trial A1 to A5 is no longer there at A6 and A7.

We also compared the probabilities for each of the fifteen words of list A. It was found that the sixth word “Ibu” (mother) had a higher probability compared to its neighboring words. This is illustrated for the scores of trials A1, A5, and A7 in Figure 2.

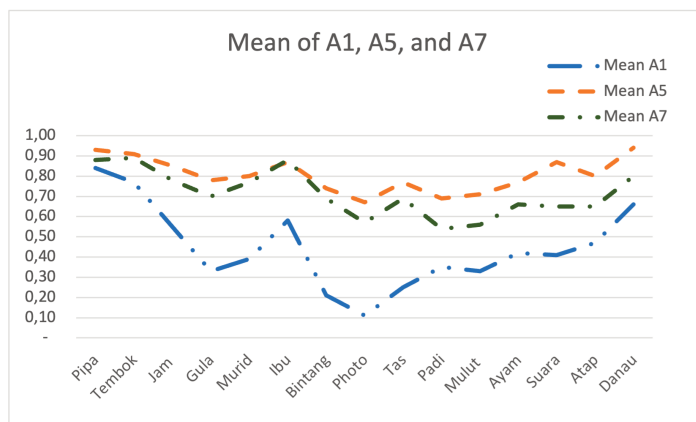


Figure 2. Probabilities of occurring of each of the fifteen-word trial A1, A5, and A7. Notice also the high probability of the word “ibu”

The structure of the trials group

EFA was used to identify whether and how the seven recall trials would form dimensions or constructs, based on covariance. We performed EFA analysis using JASP version 14 (University of Amsterdam, 2021). The results showed that the data are adequate for the EFA test (Overall KMO = 0.90; Bartlett’s Test of sphericity $2(21) = 2718.78$; $p < 0.001$; cumulative total variance explained = 75%) (Watkins, 2018). A rotation with the Oblimin method discovered three factors. Factor 1 consists of A1 ($\lambda = 0.71$) and A2 ($\lambda = 0.78$). These trials could be considered the acquisition trials of the newly presented words. Factor 2 consists of A3 ($\lambda = 0.48$), A4 ($\lambda = 0.84$), and A5 ($\lambda = 0.56$); the words are already familiar, the learning curve is less steep, and this factor was interpreted as retention. Factor 3 consists of A6 ($\lambda = 0.90$) and A7 ($\lambda = 0.87$) and was labeled as a recall factor.

Reliability

The internal reliability

The Cronbach’s alpha and coefficient of corrected correlations between items and total score are presented in Table 8 (the critical value of significant correlation was 0.088 (df = 490; alpha = 0.05). Even though the coefficient correlations were relatively low in the first two trials (A1 and A2), the coefficients gradually increased in the subsequent trials. The small and insignificant coefficients on the first trial can be attributed to the overall low memorization of the words, leading to inconsistent recall of the various items.

The ICC coefficients increased as the test progressed to later trials. It means a consistent response to the problems asked by RAVLT ascended through repetition. We assumed this finding confirmed the Hebb repetition effect in the memory/learning process (see Oberauer & Meyer, 2009; Oberauer et al., 2015). The repetition helped participants connect the words (in such a way), so they could more easily recall them, the number of correct answers increased and memorizing the word list developed gradually to a rather consistent response pattern.

Test-Retest Reliability

The retest was conducted one week to ten days after the first test. We examined the correlation between the scores in the first and second tests. A comparison between the mean scores of the two measurements was also applied (Table 9).

Table 8. The internal consistency coefficients of items in each trial

No.	Trial	Alpha Cronbach	Coefficient of Corrected Item-Total Correlation
1.	A1	0.358	0.024-0.214
2.	A2	0.539	0.079-0.291
3.	A3	0.577	0.150-0.294
4.	A4	0.625	0.118-0.310
5.	A5	0.620	0.129-0.345
6.	A6	0.722	0.179-0.407
7.	A7	0.733	0.197-0.428

Table 9. The correlations and the differences of test (A1 to A7) – retest (RA1 to RA7) of RAVLT

Trials	Mean	SD	r (N=50, df: 49)	t (df: 49)
A1	6.90	1.581	0.467**	10.678**
RA1	10.46	2.636		
A2	9.66	2.182	0.630**	9.327**
RA2	12.12	2.154		
A3	11.02	2.272	0.552**	4.803**
RA3	12.48	2.270		
A4	11.68	2.254	0.556**	4.416**
RA4	13.00	2.231		
A5	12.10	2.690	0.470**	3.972**
RA5	13.48	1.898		
A6	11.20	2.949	0.761**	6.509**
RA6	12.96	2.267		
A7	11.14	2.900	0.776**	6.779**
RA7	12.90	2.401		

Note: ** sig at $p < 0.01$

The results, as presented in Table 9, showed that the test-retest reliability coefficients are significant but also that significant differences were observed between the scores of the first and second testing of each trial. Significant differences between the trials might be affected by the short interval between the test and retest and that the subjects still remembered some items from the first assessment.

The comparison test revealed a significant difference between the first and second assessments; the participant's scores were substantially higher in the second trial. This finding drove us to inspect this further. We computed the deviation between means of the subsequent trials across the two assessment sessions. The mean deviation between A1 and A2 in the first assessment was coded as D1, whereas in the second assessment was RD1. Next, the mean deviation between A2 and A3 was coded as D2 in the initial measurement and RD2 in the second measurement. We continued calculating the mean deviation until the last pair, A6 and A7 coded as D6 and RD6, respectively (Table 10).

The t-test (Table 10) showed that two out of six revealed significant differences between the mean deviations, that were between D1-RD1 and D2-RD2. No significant differences were observed between the mean scores from trial three onward in the first and second assessments. Interestingly, the changes between trials six and seven in the first and second testing were precisely the same. These latter findings supported the reliability of the Indonesian version of RAVLT over time.

Table 10. The differences of the change of every successive trial between test and retest

No	Pairs	Mean deviation	SD deviation	t-values	P
1	D1-RD1	1.10	2.60	2.99	0.00
2	D2-RD2	1.00	2.69	2.62	0.01
3	D3-RD3	0.14	2.24	0.44	0.66
4	D4-RD4	-0.06	2.86	-0.15	0.88
5	D5-RD5	-0.38	2.30	-1.17	0.25
6.	D6-RD6	0.00	1.74	0.00	1.00

DISCUSSION

The process of adapting a verbal test instrument for Indonesia faces the difficulty that choosing literal translation of English words, the test may become more easily of more difficult, considering that the word frequency might be different for different cultures or societies, and that also words with cultural sensitivity are more likely to be recalled than foreign words, or the possibility that words can be associated more or less easy. The difficulty of recalling a word is also affected by the number of syllables, and the easiness or difficulty in pronunciation of the words in the original versus an adapted version (Geffen et al., 1994). The translation and back translation, a common procedure in adapting tests, was done by experts with understanding of the RAVLT and consensus was reached regarding the adaptation of the word lists, as presented in Table 5. Our first priority in the adaptation process was to look for words that have the same meaning or to use words from Geffen's word list A and B. The second priority is to try to keep the number of syllables the same, if not, try to make sure that the number of syllables is not much different. The third priority is pronunciation. For example: pipe (pīp) was adapted into Indonesian to be Pipa (pipa), alarm (ə'lärm) to clock (kläk). In total, four words were replaced in word list A, and nine words in word list B.

Validity and the word position effects

Word position effects

The first validity test regarding whether the recall probability of the words agrees with the position effects in each trial is in accordance with the Memory in Chains theory in the form of Primacy-Recency effects (Altmann, 2000). According to Altmann (2000), the sequence of words that we hear and express back in the form of memory, is a major factor in determining the probability of a proper recall. Words become related with each other through their sequence in which they are presented. The linkage of words to others preceding and following words causes the middle words the noisiest because they have two positions of interfering or disturbing words, namely the words before and the words after them, and this makes the middle words more difficult to remember than the first and last words. The first words are easier to remember than the middle words because there are no preceding disturbing words and next there is more time for rehearsals. The last words are easier than the middle words because they are not followed by interfering or disturbing words, the only distractors are the earlier words in the list. This causes the U-shaped curve for memorizing a word list.

The comparison of the mean value of the first, second and third group of five words in trial A1 to A5 showed indeed the U-shaped curve, in accordance with Altmann (2000). The results also showed that the words in the recency group became more difficult to recall after the presentation of wordlist B, Trial A6. The presentation of a new word list B interferes with the encoding or recall of list A, but much more for the words of the last group than for the words of the first

group, since only the recency advantage disappeared. It can be speculated that the first few words were already encoded, the later words not or less well. The recency advantage did not return at the delayed recall, as witnessed by similar averages of scores for the middle and recency word groups. Interestingly, such results were like the findings of Martín et al. (2013) and Griffin et al. (2017).

In addition to following the primacy-recency effect, the words in the Indonesian version of group A of RAVLT also experienced “The Von Restorff effect” which is the effect of a special stimulus that makes it easier for participants to remember the word than other words (Lima et al., 2019). From the data as presented in Table 6 and in Figure 2 and focus on the probability of remembering each of the fifteen words of word list A in trial A1, A5, and A7, the word “ibu” (mother) is an anomaly. Even though it is at position number 6, it is easier for the participants to remember than words at position 5 and 7 and this was always the case, that is in all seven trials. Considering the obtained probability for the recall of the word Ibu, and given the probabilities of the recall of the other words, we propose that the position of the word Ibu should be changed and should move to position 1, 2 or 3, or should exchange position with the word “Gula” or move to position 14 or 15. In all proposed position shifts it is likely that the primacy and recency effect would remain present or become bigger.

Trial clustering test

The second validity test in this study is to test the extent to which the grouping of the trials is appropriate and according to what has been described for other versions of the RAVLT. The results of the exploratory factor analysis part of our study indicated that the seven trials can be best grouped into three groups. Group 1 consisted of trials A1 and A2; Group 2 trial A3, A4, and A5; and Group 3 trial A6 and A7. Similar results were reported by Nordanskog et al. (2014), they stated that the seven trials of the RAVLT can be grouped into three groups, namely: Immediate recall, retention, and delayed recall. The results of our EFA are also only slightly different from those of Geffen et al. (1994). They stated that the seven trials clustered into four groups, namely 1) A1, A2, A3 as the acquisition trials, 2) A4, and A5 as the later acquisition trials, 3) A6 as the post distractor trial, and 4) A7 as the delayed trial. The results of our present study are also rather similar to those of de Paula et al. (2012). The results of their factor analysis of trial 1-7 RAVLT showed that trial A1-A4 grouped into one factor which they called the learning factor, trial A5 was named the transition factor, while A6-A7 grouped into one group which they called the retrieving factor. In all, all three factor analyses papers acknowledge that trial A1 to A5 should not be considered as unity and that the A7 alone or with A6 should be considered as (delayed) recall test.

From the results above, the Indonesian version of RAVLT is sensitive for the primacy and recency effect and that the scores of trials A1 to A7 largely agree with what has been internationally reported. The differences between the different papers regarding how the different trials can be grouped might be due to differences in the population of the participants.

In all, considering the presence of primacy effect in all trials, the recency effect in trial 1 to 5, and its disappearance at trial A6 and A7, the presence of three different constructs, and the presence of the Von Restorff effect, all in agreement with outcomes of previously validated internationally used versions of the RAVLT, we cannot but conclude that the Indonesian version of RAVLT should be considered as a valid test for verbal episodic memory.

The reliability of the adapted version of the RAVLT

The reliability test in this study was carried out in two ways, namely through its internal consistency using the Cronbach-Alpha and through test-retest reliability, the latter measures whether the results of the participants' answers are consistent after some time has passed.

The Cronbach-Alpha coefficient increased from one trial to the next. At the time of the first trial (A1), the reliability coefficient was 0.358, then it increased with each trial repetition. The highest reliability coefficient in the seventh trial (A7), it became 0.733. Likewise, the corrected item-total correlation coefficient also increased from A1 to the highest at A7. This is different from the research of de Sousa Magalhães et al. (2012) which showed that the Cronbach alpha coefficients A1 to A7 tended to be stable between 0.78-0.79 during the test, and 0.81-0.82 during the retest. Based on Cronbach Alpha reliability test, it can be concluded that the delayed recall of the Indonesian version of RAVLT is reliable because it is above 0.7 (Leech & Onwuegbuzie, 2010) the lower scores of the other trials only witness that the different trials measure different constructs, and this agrees with the outcomes of the exploratory factor analysis part of our study.

Previous studies investigating the reliability of the RAVLT also employed the test-retest design (e.g. Geffen et al., 1994; Carstairs et al., 2012; Hale et al., 2019; Munjir et al., 2015; Rezvanfard et al., 2011), although the time-lag between the test and retest varied from one study to another. Carstairs et al. 's took the longest time-lag, that was one year, whilst Hale et al., Munjir et al. and Resvanfard et al. used a one-month period between the test and retest. Our study took the same interval as Geffen et al., that is 6-14 days. The highest correlation in all these studies, including ours, irrespective of the used interval, was at the "Delayed-Recall", that is the recall of List-A after 20-minutes delay, except in the Geffen et al.'s study. This indicates that the most reliable indicator of memory is the delayed recall, its score is the result of learning and relearning and correct retrieval. The lowest test-retest correlation was found by us for the recall scores at trial A1; this is also in line with the Carstairs et al. and Geffen et al. The gradual increase of the reliability coefficient across the seven trials, as could be seen in Table 10, was earlier reported by Geffen et al. as well. The low test-retest correlation for A1 might also be since in the assessment, the fifteen words were new, and only less than half of the words were remembered. This finding indicates the well-known Thorndike's readiness effect in learning, that is when one is exposed to a new set of stimuli then he or she will only recall less than half of the presented materials. In the retest, the same word lists were used again, the sub-

jects might have remembered some items and the score is therefore higher. The newness of the words is less and therefore a different underlying construct could have been measured in the retest. A higher score on the retest trial 1 has also consequences for the learning aspect of the retest, as is commonly expressed as learning over trials. The results in Table 11 reflect the trial-to-trial change during the test and retest and they illustrate that the A1-A2 and A2-A3 differences are significantly larger in test compared to the retest. This illustrates that learning over trials is larger in the test session compared to the retest session. The differences between test and retest trial to trial changes were no longer present in any of the other trial to trial changes.

Munjir et al. (2015) analyzed the repetition effect, that is they compared the scores between two memory assessments with the same version of the Malay Auditory Verbal Learning Test (MAVLT) as we did, but they used a one-month interval. Their results showed that the scores were higher in the second assessment for the first, second, and third trial, no significant differences were observed on the following trials. We showed a better performance in all trials, we had more subjects (fifty vs thirty) and a shorter interval (one month vs 7-10 days) compared to Munjir et al. and this might have caused us to find more statistically significant differences. Rezvanfard et al. (2011) tested the reliability of the Persian version of the RAVLT with a one-month test-retest interval and these authors showed a difference in the results between the test and retest scores for all seven trials. The results of the research above show that the interval between the test and the retest affects the stability of the test-retest correlation scores. The shorter the time interval, the more there is an interfering “carry over effect” that causes an increase in the memory scores of the retest. The presence of a carry-over effect or practice effect can be prevented by using alternate forms of the RAVLT, as was shown by Munjir et al. (2015) for the MAVLT. This practice effect is clinically relevant in cases where participants need to be repeatedly tested.

CONCLUSIONS

The adaptation of the RAVLT test is documented, as well that indications of its reliability and validity are now obtained. The reliability test shows that the internal consistency of the instrument increases with the later trials of the test as a delayed memory test. In addition, there are positive and significant correlations between test and retest scores, which even and also increase towards the later trials. Both results show that a consistent trait is captured in the latter trials of the adapted RAVLT.

The validation part of the study was theoretically guided: the recall of the words in the various trials is in accordance with the Memory in Chains theory predicting that primacy and recency effects will occur. A Von Restorff effect for the word “ibu”, was found, while the factor analyses found showed that the adapted version of RAVLT also agrees with the theoretical view that three different aspects of memory are assessed: immediate memory, retention, and delayed

recall. All three findings contribute to the validity of the adapted version as a verbal memory test. It is proposed that the word “Ibu” should change its position, for example change position with the word “gula”. The usage of the for Indonesian adapted RAVLT awaits definite normative scores, which need to be corrected for age and education, as is nowadays necessary. Now only preliminary normative data for Javanese adults of the adapted version are available (Wahyuningrum et al., 2021).

Funding

This work was supported the Directorate of Higher Education General of Indonesia with number 010/LL6/SP2H.1/AMD/Penelitian/2020

REFERENCES

- Altmann, E. M. (2000). Memory in Chains: Modeling Primacy and Recency Effects in Memory for Order. *Proceedings of the Twenty Second Annual Meeting of the Cognitive Science Society*, 31–36. <http://hfac.gmu.edu/people/altmann/nairne-rpm.txt>
- Alvarez-Schulze, V., Cattaneo, G., Pachón-García, C., Solana-Sánchez, J., Tormos, J. M., Pascual-Leone, A., & Bartrés-Faz, D. (2022). Validation and Normative Data of the Spanish Version of the Rey Auditory Verbal Learning Test and Associated Long-Term Forgetting Measures in Middle-Aged Adults. *Frontiers in Aging Neuroscience*, 14. <https://doi.org/10.3389/fnagi.2022.809019>
- Badan-Pusat-Statistik. (2021). *Statistik Indonesia 2021*.
- Badcock, J. C., Dragović, M., Dawson, L., & Jones, R. (2011). Normative data for rey's auditory verbal learning test in individuals with schizophrenia. *Archives of Clinical Neuropsychology*, 26(3), 205–213. <https://doi.org/10.1093/arclin/acr005>
- Baddeley, A. (2012). Working memory: Theories, models, and controversies. *Annual Review of Psychology*, 63, 1–29. <https://doi.org/10.1146/annurev-psych-120710-100422>
- Bolarinwa, O. (2015). Principles and methods of validity and reliability testing of questionnaires used in social and health science researches. *Nigerian Postgraduate Medical Journal*, 22(4), 195. <https://doi.org/10.4103/1117-1936.173959>
- Callahan, C. D., & Johnstone, B. (1994). The Clinical Utility of the Rey Auditory-Verbal Learning Test in Medical Rehabilitation. In *Journal of Clinical Psychology in Medical Settings* (Vol. 1, Issue 3).
- Capitani, E., della Sala, S., Logie, R. H., & Spinnler, H. (1992). Recency, Primacy, and Memory: Reappraising and Standardising the Serial Position Curve. *Cortex*, 28(3), 315–342. [https://doi.org/10.1016/S0010-9452\(13\)80143-8](https://doi.org/10.1016/S0010-9452(13)80143-8)
- Carstairs, J. R., Shores, E. A., & Myers, B. (2012). Australian Norms and Retest Data for the Rey Auditory and Verbal Learning Test. *Australian Psychologist*, 47(4), 191–197. <https://doi.org/10.1111/j.1742-9544.2012.00086.x>
- Cooper, S., & Greene, J. D. W. (2005). The clinical assessment of the patient with early dementia. In *Neurology in Practice* (Vol. 76, Issue SUPPL. 5). <https://doi.org/10.1136/jnnp.2005.081133>
- Cromer, J., Krishna, V., Nguyen, A., & Acquadro, C. (2013). Cross-cultural adaptation of a research version of the Rey Auditory Verbal Learning Test (RAVLT) into Japanese. In *ISPOR 18th Annual International Meeting* (pp. 1–1). www.mapigroup.com
- de Paula, J. J., Pacheco, L., Melo, C., Nicolato, R., Nunes De Moraes, E., Bicalho, M. A., Hamdan, A. C., & Fernandes Malloy-Diniz, L. (2012). Reliability and construct validity of the Rey-Auditory Verbal Learning Test in Brazilian elders Fidedignidade e validade de construto do Teste de Aprendizagem Auditivo-Verbal de Rey em idosos brasileiros. *Rev Psiq Clin*, 39(1), 19–23.
- de Sousa Magalhães, S., Malloy-Diniz, L. F., & Hamdan, A. C. (2012). Validity convergent and reliability test-retest of the Rey Auditory Verbal Learning Test. *Clinical Neuropsychiatry: Journal of Treatment Evaluation*, 9(3), 129–137.

- Fard, E. K., Keelor, J. L., Bagheban, A. A., & Keith, R. W. (2016). Comparison of the Rey Auditory Verbal Learning Test (RAVLT) and digit test among typically achieving and gifted students. *Iranian Journal of Child Neurology*, 10(2), 26-37.
- Gavett, B. E., & Horwitz, J. E. (2012). Immediate list recall as a measure of short-term episodic memory: Insights from the serial position effect and item response theory. In *Archives of Clinical Neuropsychology* (Vol. 27, Issue 2, pp. 125–135). Oxford University Press. <https://doi.org/10.1093/arclin/acr104>
- Geffen, G. M., Butterworth, P., & Geffen, L. B. (1994). Test-Retest Reliability of a New Form of the Auditory Verbal Learning Test (AVLT). *Archives of Clinical Neuropsychology*, 9(4), 303–316.
- Gooren, T., Schlattmann, P., & Neu, P. (2013). A comparison of cognitive functioning in acute schizophrenia and depression. *Acta Neuropsychiatrica*, 25(6), 334–341. <https://doi.org/10.1017/neu.2013.21>
- Griffin, J. W., John, S. E., Adams, J. W., Bussell, C. A., Saurman, J. L., & Gavett, B. E. (2017). The effects of age on the learning and forgetting of primacy, middle, and recency components of a multi-trial word list. *Journal of Clinical and Experimental Neuropsychology*, 39(9), 900–912. <https://doi.org/10.1080/13803395.2017.1278746>
- Groth-Marnat, G. (2003). *Handbook of Psychological Assessment* (4th ed.). John Wiley & Sons, Inc.
- Hale, C., Last, B. S., Meier, I. B., Yeung, L. K., Budge, M., Sloan, R. P., Small, S. A., & Brickman, A. M. (2019). The ModRey: An Episodic Memory Test for Nonclinical and Preclinical Populations. *Assessment*, 26(6), 1154–1161. <https://doi.org/10.1177/1073191117723113>
- Hawkins, K. A., Dean, D., & Pearson, G. D. (2004). Alternative forms of the Rey Auditory Verbal Learning Test: A review. In *Behavioural Neurology* (Vol. 15). IOS Press.
- Hendriks, M., van Luitelaar, G., Halim, M., & Sulastrri, A. (2016). *Development of The Indonesian Neuropsychological Test Battery*. A Joint Research Proposal of Raboud University of Nijmegen, the Netherlands, Atma Jaya Indonesian Catholic University, Jakarta, Indonesia, and Soegijapranata Catholic University, Semarang, Indonesia
- Henke, K. (2010). A model for memory Systems based on processing modes rather than consciousness. *Nature Reviews | Neuroscience*. 11. 523-531
- Johnstone, B., Vieth, A. Z., Johnson, J. C., & Shaw, J. A. (2000). Recall as a Function of Single versus Multiple Trials: Implication of Rehabilitation. *Rehabilitation Psychology*, 45(1), 3–19. <https://doi.org/10.1037/0090-5550.45.1.3>
- Kessels, R. P. C., & Hendriks, M. P. H. (2016). Neuropsychological Assessment. In *Encyclopedia of Mental Health: Second Edition* (pp. 197–201). Elsevier Inc. <https://doi.org/10.1016/B978-0-12-397045-9.00136-1>
- Kipps, C. M., & Hodges, J. R. (2005). Cognitive assessment for clinicians. In *Neurology in Practice* (Vol. 76, Issue 1). <https://doi.org/10.1136/jnnp.2004.059758>
- Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: A practical primer for t-tests and ANOVAs. *Frontiers in Psychology*, 4(NOV). <https://doi.org/10.3389/fpsyg.2013.00863>
- Leech, N. L., & Onwuegbuzie, A. J. (2010). Guidelines for Conducting and Reporting Mixed Research in the Field of Counseling and Beyond. *Journal of Counseling & Development*, 88(1), 61–69. <https://doi.org/10.1002/j.1556-6678.2010.tb00151.x>
- Lima, G., Teldeschi, A., Oliveira, N., Bernardes, C., Drummond, C., Assunção, N., Bortolini, T., & Mattos, P. (2019). The von restorff effect in the brazilian version of the rey auditory verbal learning test in an elderly population. *Dementia e Neuropsychologia*, 13(1), 89–96. <https://doi.org/10.1590/1980-57642018dn13-010010>
- Maharani, V. (2015). Perbandingan Fungsi Kognitif pada Anak-Anak dengan Gangguan Gizi dan Anak dengan Gizi Normal. *Thesis*. Jakarta; Fakultas Kedokteran Universitas Indonesia
- Martin, M. E., Sasson, Y., Crivelli, L., Roldán Gerschovich, E., Campos, J. A., Calcagno, M. L., Leiguarda, R., Sabe, L., Allegri, R. F., & Cognitivo Leve, D. (2013). Relevance of the serial position effect in the differential diagnosis of mild cognitive impairment, Alzheimer-type dementia, and normal ageing PALABRAS CLAVE. *Neurologia*, 28(4), 219–225. www.elsevier.es/neurologia

- Messinis, L., Tsakona, I., Malefaki, S., & Papathanasopoulos, P. (2007). Normative data and discriminant validity of Rey's Verbal Learning Test for the Greek adult population. *Archives of Clinical Neuropsychology*, 22(6), 739–752. <https://doi.org/10.1016/j.acn.2007.06.002>
- Morrison, R. L., Pei, H., Novak, G., Kaufer, D. I., Welsh-Bohmer, K. A., Ruhmel, S., & Narayan, V. A. (2018). A computerized, self-administered test of verbal episodic memory in elderly patients with mild cognitive impairment and healthy participants: A randomized, crossover, validation study. *Alzheimer's and Dementia: Diagnosis, Assessment and Disease Monitoring*, 10, 647–656. <https://doi.org/10.1016/j.dadm.2018.08.010>
- Munjir, N., Othman, Z., Zakaria, R., Shafin, N., Hussain, N. A., Desa, A. M., & Ahmad, A. H. (2015). Equivalence and practice effect of alternate forms for Malay version of auditory verbal learning test (MAVLT). *EXCLI Journal*, 14, 801–808. <https://doi.org/10.17179/excli2015-280>
- Neblina, C. (2012). *Construct and Criterion Validity of the Rey Auditory Verbal Construct Learning Test-Spanish Version in Adults with Traumatic Brain Injury* [University of Nevada]. <https://digitalscholarship.unlv.edu/thesedissertations/1686>
- Nielsen, T. R., Segers, K., Vanderaspolden, V., Bekkhus-Wetterberg, P., Minthon, L., Pissioti, A., Bjørkløf, G. H., Beinhoff, U., Tsolaki, M., Gkioka, M., & Waldemar, G. (2018). Performance of middle-aged and elderly European minority and majority populations on a Cross-Cultural Neuropsychological Test Battery (CNTB). *Clinical Neuropsychologist*, 32(8), 1411–1430. <https://doi.org/10.1080/13854046.2018.1430256>
- Nordanskog, P., Larsson, M. R., Larsson, E. M., & Johanson, A. (2014). Hippocampal volume in relation to clinical and cognitive outcome after electroconvulsive therapy in depression. *Acta Psychiatrica Scandinavica*, 129(4), 303–311. <https://doi.org/10.1111/acps.12150>
- Oberauer, K., Jones, T., & Lewandowsky, S. (2015). The Hebb repetition effect in simple and complex memory span. *Memory and Cognition*, 43(6), 852–865. <https://doi.org/10.3758/s13421-015-0512-8>
- Oberauer, K., & Meyer, N. (2009). The contributions of encoding, retention, and recall to the Hebb effect. *Memory*, 17(7), 774–781. <https://doi.org/10.1080/09658210903107861>
- Pliskin, J. I., DeDios Stern, S., Resch, Z. J., Saladino, K. F., Ovsiew, G. P., Carter, D. A., & Soble, J. R. (2021). Comparing the Psychometric Properties of Eight Embedded Performance Validity Tests in the Rey Auditory Verbal Learning Test, Wechsler Memory Scale Logical Memory, and Brief Visuospatial Memory Test–Revised Recognition Trials for Detecting Invalid Neuropsychological Test Performance. *Assessment*, 28(8), 1871–1881. <https://doi.org/10.1177/1073191120929093>
- Rezvanfard, M., Ekhtiari, H., Noroozian, M., Rezvanifar, A., Nilipour, R., & Javan, G. K. (2011). The Rey Auditory Verbal Learning Test: Alternate Forms Equivalency and Reliability for the Iranian Adult Population (Persian Version). *Article in Archives of Iranian Medicine*, 14(2). <https://www.researchgate.net/publication/50248727>
- Schoenberg, M. R., Dawson, K. A., Duff, K., Patton, D., Scott, J. G., & Adams, R. L. (2006). Test performance and classification statistics for the Rey Auditory Verbal Learning Test in selected clinical samples. *Archives of Clinical Neuropsychology*, 21(7), 693–703. <https://doi.org/10.1016/j.acn.2006.06.010>
- Schroeder, R. W., Martin, P. K., & Walling, A. (2019). Neuropsychological Evaluations in Adults. *American Family Physician*, 99(2). <https://pubmed.ncbi.nlm.nih.gov/30633479/>
- Stallings, G., Boake, C., & Sherer, M. (1995). Comparison of the California Verbal Learning Test and the Rey Auditory Verbal Learning Test in Head-Injured Patients. *Journal of Clinical and Experimental Neuropsychology*, 17(5), 706–712. <https://doi.org/10.1080/01688639508405160>
- Tierney, M. C., Moineddin, R., & McDowell, I. (2010). Prediction of all-cause dementia using neuropsychological tests within 10 and 5 years of diagnosis in a community-based sample. *Journal of Alzheimer's Disease*, 22(4), 1231–1240. <https://doi.org/10.3233/JAD-2010-100516>
- Vlahou, C. H., Kosmidis, M. H., Dardagani, A., Tsotsi, S., Giannakou, M., Giazkoulidou, A., Zervoudakis, E., & Pontikakis, N. (2013). Development of the Greek verbal learning test: Reliability, construct validity, and normative standards. *Archives of Clinical Neuropsychology*, 28(1), 52–64. <https://doi.org/10.1093/arclin/acs099>

- Wahyuningrum, S. E., van Luitelaar, G., & Sulastrri, A. (2021). An online platform and a dynamic database for neuropsychological assessment in Indonesia. *Applied Neuropsychology:Adult*. <https://doi.org/10.1080/23279095.2021.1943397>
- Watkins, M. W. (2018). Exploratory Factor Analysis: A Guide to Best Practice. *Journal of Black Psychology, 44*(3), 219–246. <https://doi.org/10.1177/0095798418771807>
- Widyastuti, K., Susilawathi, N. M., Utama, I. M. S., & Laksmidewi, A. P. (2016). Perbedaan Angka Limfosit CD4 Pada Penderita HIV dengan Gangguan Memori Verbal dan Tanpa Gangguan Memori Verbal di RSUP Sanglah Denpasar. In *Proposal Penelitian Skema Hibah Dosen Muda Denpasar: Fakultas Kedokteran Universitas Udayana*
- Wiens, A. N., Tindall, A. G., & Crossen, J. R. (1994). California verbal learning test: A normative data study. *Clinical Neuropsychologist, 8*(1), 75–90. <https://doi.org/10.1080/13854049408401545>
- Zeidman, Y., Schweiger, A., Korczyn, A. D., Vachapov, V., Verhovsky, R., Halperin, I., Neufeld, M. Y., & Andelman, F. (2008). Rey Auditory Verbal Learning Test as a tool for diagnosis of Mild cognitive impairment. *Acta Neuropsychologica, 6*(2). <https://www.researchgate.net/publication/288561243>

Corresponding author:

Margaretha Sih Setija Utami

Psychology Faculty

Soegijapranata Catholic University

Jl. PawiyatanLuhur IV/no.1, Bendan Dhuwur, Semarang, Indonesia

Phone: +6285727037075

e-mail: cicih@unika.ac.id